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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
STONER, KILEY SHAWN	

ART UNIT	PAPER NUMBER
1793	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/532,965	KU ET AL.	
	Examiner	Art Unit	
	KILEY STONER	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 October 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2 and 9-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2 and 9-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 2 is rejected under 35 U.S.C. 102(b) as being anticipated by Desai et al. (US 5,170,931) (hereafter Desai).

With respect to independent claim 2, Desai teaches a compression bonding method (column 1, line 58; column 4, line 67; and column 7, lines 68-column 8, line 1) comprising: disposing a first plurality of metal bonding film shapes (12) in a pattern on a substrate (4) and disposing a second plurality of metal bonding film shapes (11) in a pattern on a bonded element (2); and disposing the bonded element (2) above the first plurality of metal bonding film shapes (12) and applying heat to the substrate and pressure to the bonded element (column 1, line 58; and column 4, line 67), thereby bonding the bonded element (4) having the second plurality of metal bonding film shapes (11) to the substrate (4) having the first plurality of metal bonding film shapes (12), wherein the first plurality of metal bonding film shapes (12) are spaced apart from

each other (note Figures 1A and 4). In the process of Desai the first plurality of metal bonding film shapes and the second plurality of metal bonding film shapes inherently have to be disposed in patterns on the substrate and bonded element, respectively, prior to the application of heat to the substrate and pressure to the bonded element. The thermal compression bonding process taught of Desai inherently requires pressure to be applied to the bonded element. If pressure was not applied to the bonded element a satisfactory bond would not be formed. In addition, it is the examiner's position that during the thermocompression bonding process of Desai some heat would inherently enter the substrate (bottom component) through conduction.

Claim 2 is rejected under 35 U.S.C. 102(b) as being anticipated by Miyajima (JP 05-109977).

With respect to independent claim 2, Miyajima teaches a compression bonding method (abstract) comprising: disposing a first plurality of metal bonding film shapes (2) in a pattern on a substrate (B) and disposing a second plurality of metal bonding film shapes (5) in a pattern on a bonded element (A); and disposing the bonded element (A) above the first plurality of metal bonding film shapes (2) and applying heat to the substrate and pressure to the bonded element (abstract), thereby bonding the bonded element (A) having the second plurality of metal bonding film shapes (5) to the substrate (B) having the first plurality of metal bonding film shapes (2), wherein the first plurality of metal bonding film shapes (2) are spaced apart from each other (note Figures a, b and c). In the process of Miyajima the first plurality of metal bonding film shapes and the

second plurality of metal bonding film shapes inherently have to be disposed in patterns on the substrate and bonded element, respectively, prior to the application of heat to the substrate and pressure to the bonded element.

The thermal compression bonding process of Miyajima inherently requires pressure to be applied to the bonded element. If pressure was not applied to the bonded element a satisfactory bond would not be formed. In addition, it is the examiner's position that during the thermocompression bonding process of Miyajima some heat would inherently enter the substrate (bottom component) through conduction.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2, 9 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Desai in view of JP-11204591.

With respect to independent claim 2, Desai teaches a compression bonding method (column 1, line 58; column 4, line 67; and column 7, lines 68-column 8, line 1) comprising: disposing a first plurality of metal bonding film shapes (12) in a pattern on a substrate (4) and disposing a second plurality of metal bonding film shapes (11) in a

pattern on a bonded element (2); and disposing the bonded element (2) above the first plurality of metal bonding film shapes (12) and applying heat to the substrate and pressure to the bonded element (column 1, line 58; and column 4, line 67), thereby bonding the bonded element (4) having the second plurality of metal bonding film shapes (11) to the substrate (4) having the first plurality of metal bonding film shapes (12), wherein the first plurality of metal bonding film shapes (12) are spaced apart from each other (note Figures 1A and 4). In the process of Desai the first plurality of metal bonding film shapes and the second plurality of metal bonding film shapes intrinsically have to be disposed in patterns on the substrate and bonded element, respectively, prior to the application of heat to the substrate and pressure to the bonded element.

Desani teaches using thermal compression bonding but fails to explicitly teach applying heat to the substrate and pressure to the bonded element. In the process of Desani compressive pressure is intrinsically applied to the bonded element. While, JP-11204591 teaches applying heat to a substrate (bottom component) during a thermal compression bonding process (Title; and Figures 1-5).

At the time of the invention it would have been obvious to heat the substrate (bottom) component of Desani during a thermal compression bonding process as taught by JP-11204591 in order to insure that the components are properly bonded together. In addition, the claim would have been obvious because a particular known technique (heating the bottom substrate in a thermal compression bonding process) was recognized as part of the ordinary capabilities of one skilled in the art. Thus, the claim would have been obvious because “a person or ordinary skill has good reason to

pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense." Furthermore, the claim would have been obvious because a person of ordinary skill in the art would have been motivated to combine the prior art to achieve the claimed invention and that there would have been a reasonable expectation of success.

With respect to claim 9, Desai teaches that the substrate is a printed circuit board, but fails to teach that the substrate is selected from the group consisting of silicon, metal and ceramic. The examiner takes Official Notice that printed circuit boards are commonly made of silicon or ceramics.

With respect to claim 13, Miyajima teaches thermocompression bonding but fails to disclose the temperature of the process; however, one of ordinary skill in the art would have recognized that the maximum temperature should be below 350°C in order to prevent thermal degradation of the printed circuit board.

Claims 2, 9 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyajima (JP 05-109977) in view of JP-11204591.

With respect to independent claim 2, Miyajima teaches a compression bonding method (abstract) comprising: disposing a first plurality of metal bonding film shapes (2) in a pattern on a substrate (B) and disposing a second plurality of metal bonding film shapes (5) in a pattern on a bonded element (A); and disposing the bonded element (A) above the first plurality of metal bonding film shapes (2) and applying heat to the

substrate and pressure to the bonded element (abstract), thereby bonding the bonded element (A) having the second plurality of metal bonding film shapes (5) to the substrate (B) having the first plurality of metal bonding film shapes (2), wherein the first plurality of metal bonding film shapes (2) are spaced apart from each other (note Figures a, b and c). In the process of Miyajima the first plurality of metal bonding film shapes and the second plurality of metal bonding film shapes intrinsically have to be disposed in patterns on the substrate and bonded element, respectively, prior to the application of heat to the substrate and pressure to the bonded element.

Miyajima teaches using thermal compression bonding but fails to explicitly teach applying heat to the substrate and pressure to the bonded element. In the process of Miyajima compressive pressure is intrinsically applied to the bonded element. While, JP-11204591 teaches applying heat to a substrate (bottom component) during a thermal compression bonding process (Title; and Figures 1-5).

At the time of the invention it would have been obvious to heat the substrate (bottom) component of Miyajima during a thermal compression bonding process as taught by JP-11204591 in order to insure that the components are properly bonded together. In addition, the claim would have been obvious because a particular known technique (heating the bottom substrate in a thermal compression bonding process) was recognized as part of the ordinary capabilities of one skilled in the art. Thus, the claim would have been obvious because "a person or ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and

common sense." Furthermore, the claim would have been obvious because a person of ordinary skill in the art would have been motivated to combine the prior art to achieve the claimed invention and that there would have been a reasonable expectation of success.

With respect to claim 9, Miyajima teaches that the substrate is an integrated circuit, but fails to teach that the substrate is selected from the group consisting of silicon, metal and ceramic. The examiner takes Official Notice that integrated circuits are commonly made of silicon or ceramics.

With respect to claim 13, Miyajima teaches thermocompression bonding but fails to disclose the temperature of the process; however, one of ordinary skill in the art would have recognized that the maximum temperature should be below 350°C in order to prevent thermal degradation to the integrated circuit.

Claims 9-12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Desai as applied to claim 2 above, and further in view of Jairazbhoy et al. (US 2002/0000331 A1) (hereafter Jairazbhoy).

Desai teaches all of the limitations of the claims except that the first and second plurality of metal bonding film shapes are made of a material selected from the group consisting of aluminum, magnesium, zinc, and titanium; the first and second plurality of metal bonding film shapes are stripes or dots; the bonded element is glass or metal; bonded element contacts more than one of the first and second plurality of metal bonding film shapes.

Jairazbhoy teaches a compression bonding method comprising patterning bonding metal dots (16) on a metal substrate (80), disposing a second plurality of metal bonding film shapes (99) in a pattern on a bonded element (98), placing the bonding element above the bonding dots and applying heat to the substrate and pressure to the bonded element (figure 12B and paragraphs 36, 37, 43 and 49). The dots comprise aluminum (paragraph 37). In an alternate embodiment metal dots (62) are patterned on a metal substrate (80) which is bonded to a metal sheet (10). See figure 1B and paragraph 30.

At the time of the invention it would have been obvious to one of ordinary skill in the art to implement the thermal compression bonding process of Desai to bond the objects taught by Jairazbhoy in order to form the desired assembly. Furthermore, all of the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

Claims 9-12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Desai and JP-11204591 as applied to claim 2 above, and further in view of Jairazbhoy.

Desai and JP-11204591 teach all of the limitations of the claims except that the first and second plurality of metal bonding film shapes are made of a material selected from the group consisting of aluminum, magnesium, zinc, and titanium; the first and

second plurality of metal bonding film shapes are stripes or dots; the bonded element is glass or metal; bonded element contacts more than one of the first and second plurality of metal bonding film shapes.

Jairazbhoy teaches a compression bonding method comprising patterning bonding metal dots (16) on a metal substrate (80), disposing a second plurality of metal bonding film shapes (99) in a pattern on a bonded element (98), placing the bonding element above the bonding dots and applying heat to the substrate and pressure to the bonded element (figure 12B and paragraphs 36, 37, 43 and 49). The dots comprise aluminum (paragraph 37). In an alternate embodiment metal dots (62) are patterned on a metal substrate (80) which is bonded to a metal sheet (10). See figure 1B and paragraph 30.

At the time of the invention it would have been obvious to one of ordinary skill in the art to implement the thermal compression bonding processes of Desai and JP-11204591 to bond the objects taught by Jairazbhoy in order to form the desired assembly. Furthermore, all of the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

Claims 9-12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyajima as applied to claim 2 above, and further in view of Jairazbhoy.

Miyajima teaches all of the limitations of the claims except that the first and second plurality of metal bonding film shapes are made of a material selected from the group consisting of aluminum, magnesium, zinc, and titanium; the first and second plurality of metal bonding film shapes are stripes or dots; the bonded element is glass or metal; bonded element contacts more than one of the first and second plurality of metal bonding film shapes.

Jairazbhoy teaches a compression bonding method comprising patterning bonding metal dots (16) on a metal substrate (80), disposing a second plurality of metal bonding film shapes (99) in a pattern on a bonded element (98), placing the bonding element above the bonding dots and applying heat to the substrate and pressure to the bonded element (figure 12B and paragraphs 36, 37, 43 and 49). The dots comprise aluminum (paragraph 37). In an alternate embodiment metal dots (62) are patterned on a metal substrate (80) which is bonded to a metal sheet (10). See figure 1B and paragraph 30.

At the time of the invention it would have been obvious to one of ordinary skill in the art to implement the thermal compression bonding process of Miyajima to bond the objects taught by Jairazbhoy in order to form the desired assembly. Furthermore, all of the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their

respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

Claims 9-12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyajima and JP-11204591 as applied to claim 2 above, and further in view of Jairazbhoy.

Miyajima and JP-11204591 teach all of the limitations of the claims except that the first and second plurality of metal bonding film shapes are made of a material selected from the group consisting of aluminum, magnesium, zinc, and titanium; the first and second plurality of metal bonding film shapes are stripes or dots; the bonded element is glass or metal; bonded element contacts more than one of the first and second plurality of metal bonding film shapes.

Jairazbhoy teaches a compression bonding method comprising patterning bonding metal dots (16) on a metal substrate (80), disposing a second plurality of metal bonding film shapes (99) in a pattern on a bonded element (98), placing the bonding element above the bonding dots and applying heat to the substrate and pressure to the bonded element (figure 12B and paragraphs 36, 37, 43 and 49). The dots comprise aluminum (paragraph 37). In an alternate embodiment metal dots (62) are patterned on a metal substrate (80) which is bonded to a metal sheet (10). See figure 1B and paragraph 30.

At the time of the invention it would have been obvious to one of ordinary skill in the art to implement the thermal compression bonding processes of Miyajima and JP-

11204591 to bond the objects taught by Jairazbhoy in order to form the desired assembly. Furthermore, all of the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

Response to Arguments

Applicant's arguments with respect to claims 2 and 9-14 have been considered but are not persuasive or moot in view of the new ground(s) of rejection.

The applicant argues that Desai and Miyajima does not indicate the nature of the thermal compression bonding, and fails to disclose that heat is applied to the substrate, while pressure is applied to the bonded element (emphasis added by the examiner). The applicant's argument is not commensurate in scope with the claims because claim 2 does not positively require heat to be applied to the substrate, while pressure is applied to the bonded element. In addition, thermal compression bonding inherently requires the application of heat and pressure. The processes of Desai and Miyajima would inherently apply compressive pressure to the substrates. Desai and Miyajima are silent with regard to application of heat; however, JP-11204591 clearly teaches applying heat to a substrate (bottom component) during thermal compression bonding. It should further be noted that during a thermal compression bonding process some heat would inherently enter the substrate (bottom component) through conduction.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kiley Stoner whose telephone number is 571-272-1183. The examiner can normally be reached Monday-Thursday (9:30 a.m. to 8:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on 571-272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kiley Stoner/
Primary Examiner, Art Unit 1793